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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/709,099

04/14/2004

Hou-Wei Lin

REAP0032USA

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05/17/2006

NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION
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MERRIFIELD, VA 22116

EXAMINER

ALPHONSE, FRITZ

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/709,099

Applicant(s)

LIN ET AL.

Examiner

Fritz Alphonse

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1, 7</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 16 is objected to because of the following informalities: it seems that method claim 16 depends on apparatus claim 10. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is not clear to what it meant by "P is equal to M plus N." In addition, the parameters (P, M and N) are undefined in the claims.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eyuboglu (U.S. Pat. No. 5,214,672) in view of Azadet (U.S. Pat. No. 7,000,175).

As to claim 10, Eyuboglu (figs. 12-18) discloses a parallel decision-feedback decoder (PDFD; col. 18, lines 21-32) comprising: a plurality of shift registers (fig. 12), wherein for each state of a code utilized by an incoming data stream, a survivor metric for a state is shifted into the shift register for the state (col. 18, lines 33-64); a decision device coupled to the shift registers

Art Unit: 2133

for outputting a first survivor metric according to survivor metrics in the shift registers; and a shift register having N delay cells, wherein the first survivor metric is shifted into the second shift register (col. 19, lines 4-35).

Eyuboglu differs from claim 10 in that he does not specifically teach a P-tap parallel decision-feedback decoder.

However, in the same field of endeavor, Azadet discloses a joint equalization and decoding for gigabit communications including a P-tap parallel decision-feedback decoder.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to improve upon the communication system, as disclosed by Azadet. Doing so would reduce state sequence estimation techniques to reduce the complexity of the maximum likelihood sequence estimators by merging several states.

As to claims 11-12, Eyuboglu does not explicitly disclose a PDFD comprising a plurality of inter-symbol interference (ISI) value calculators for calculating an ISI value for each state. However, the limitations are very well known in the art, as evidenced by Azadet (col. 12, lines 15-35). See the motivation for the reason disclosed in claim 10 above.

As to claims 13-15, Eyuboglu (figs. 12-18) discloses a PDFD, wherein the decision device chooses the survivor metric according to survivor metrics at the M^{th} cells of the shift registers (col. 18, lines 33-64). Eyuboglu discloses a PDFD, wherein the decision device chooses the survivor metric by averaging survivor metrics at the M^{th} cells of shift registers and then selecting a survivor metric being closest to the average as survivor metric (col. 19, lines 4-35).

As to claims 16-18, Eyuboglu teaches a PDFD, which performs Viterbi decoding of an incoming data stream (fig. 6); the incoming data stream is a four-dimensional gigabit Ethernet stream utilizing an 8-state Trellis code.

As to claim 1, method claim 1 corresponds to apparatus claim 10; therefore, it is analyzed as previously discussed in claim 1 above.

As to claims 2-3, Eyuboglu does not explicitly disclose a PDFD comprising a plurality of inter-symbol interference (ISI) value calculators for calculating an ISI value for each state. However, the limitations are very well known in the art, as evidenced by Azadet (col. 12, lines 15-35). See the motivation for the reason disclosed in claim 10 above.

As to claims 4-6, Eyuboglu (figs. 12-18) discloses a PDFD, wherein the decision device chooses the survivor metric according to survivor metrics at the M^{th} cells of the shift registers (col. 18, lines 33-64). Eyuboglu discloses a PDFD, wherein the decision device chooses the survivor metric by averaging survivor metrics at the M^{th} cells of shift registers and then selecting a survivor metric being closest to the average as survivor metric (col. 19, lines 4-35).

As to claims 7-9, Eyuboglu discloses a method, wherein the PDFD performs Viterbi decoding of the incoming data stream (fig. 6); the incoming data stream is a four-dimensional gigabit Ethernet stream utilizing an 8-state Trellis code.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks, Washington, D.C. 20231

Art Unit: 2133

or faxed to: (703) 872-9306 for all formal communications.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz Alphonse, whose telephone number is (571) 272-3813. The examiner can normally be reached on M-F, 8:30-6:00, Alt. Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert De Cady, can be reached at (571) 272-3819.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Fritz Alphonse

Art Unit 2133

May 12, 2006



**GUY LAMARRE
PRIMARY EXAMINER**